

CHARGE NUMBER: 0307  
PROJECT TITLE: Measurements Development  
PROJECT LEADER: D. R. Fox  
PERIOD COVERED: August, 1984  
DATE OF REPORT: September 6, 1984

## I. Loose Ends

### Objective:

To develop a dynamic sensor and/or laboratory instrument for measuring loose ends and to determine the effect of particle size, particle mixing, blend formula, tobacco weight, and OV on cigarette loose ends.

### Status:

A second set of blends and cigarettes have been requested from Semiworks to study the effect of DIET addition on loose ends and the mixing law relationship for loose ends. The first test, in which DIET was mixed with DBC bright tobacco, showed increasing loose ends with higher levels of DIET at constant firmness and density index. The second test will again involve mixtures of bright and DIET. Two types of DIET will be used: normal production DIET, and pilot plant DIET from Project 1801 that has significantly improved shred size.

### Plans:

The second DIET-bright test is expected to be run later in September.

## II. Tobacco Moisture

### Objective:

To develop an instantaneous, non-destructive technique for determining the moisture content of bulk tobacco and cigarettes.

### Status:

Calibrations for Marlboro filler were obtained from on-line testing in Semiworks, in which cutter and dryer conditions were varied to give a range of moistures, as well as from laboratory conditioning of material. The data from the various methods compare well to each other at higher moistures. At lower moistures (below ~13%), there was a difference in response between the samples tested "on the fly" during the Semiworks run and the laboratory samples. Since PG and Glycerine analyses showed no significant difference between the two sets of samples, tobacco temperature is suspected to be the cause. Tests are planned to investigate this and to try to differentiate between actual instrument sensitivity effects and possible changes in sample moisture due to evaporative cooling.

Since calibrations for Marlboro have been installed for the OC Semiworks unit and several procedural problems have been corrected, good results have been obtained. The Richmond Stemmary started up during the month and has reported good results with their new units. Based on their results, the Louisville Stemmary has decided to purchase an L-band unit immediately rather than

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borrow one from Richmond for evaluation.

An IBM-PC XT was interfaced with the L-band in the lab to store microwave results in a form that can easily be transferred to the DECsystem. The STSC APL package on the PC was used for this task. The APL is quite versatile and powerful, and required very little time to program. As a result, we will be using the PC/APL system for other tasks in the laboratory in the future.

Plans:

Additional calibrations will be developed in the lab for other materials, including for several grades of bright tobacco to be used in a test to evaluate the effect of large stem level on cigarette properties (to be conducted by Project 0400). Testing on the effect of tobacco temperature will also be conducted to determine whether it is the cause of the offsets observed between on-line and lab calibrations for low OV's. IBM PC's are expected to arrive early in the month for the Semiworks units, and these will be programmed and installed.

### III. Mathematical Modeling

Objective:

To update the tobacco models for filling power and cigarette firmness to incorporate new tobacco materials and new measurement methods.

Status:

Testing was completed for the Blend Component Study and Model Update. Tables for the BCS were completed and are currently being reviewed. While the CV/OV data is quite reasonable, some of the sieve data shows a good deal of variability. This is not unexpected for the sieve test, but since the BCS is used as a reference, a decision on how best to report the sieve data will have to be made.

Plans:

The Blend Component Study should be submitted for approvals during September. Work will then begin on generating the mathematical models for CV, OV, RH, and firmness.



D. R. Fox

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